

WHAT IS CLAIMED IS:

1. A method for manufacturing a semiconductor device, comprising the steps of:

- 5 forming a wiring comprising silicon on a surface of a semiconductor substrate;
- covering part of the wiring with a resist pattern;
- implanting ions into the wiring using the resist pattern as a mask;
- removing the resist pattern;
- 10 removing a surface layer of the wiring to a depth of at least 5 nm to thin the wiring; and
- forming a metal silicide film on a surface of the wiring by causing reaction between a surface layer of the wiring of which thickness is thus reduced and a refractory metal which reacts with
- 15 silicon to form silicide.

2. A method for manufacturing a semiconductor device according to claim 1, wherein the metal silicide forming step comprises the steps of:

- 20 depositing a metallic film comprising a refractory metal which reacts with silicon to form silicide, on a surface of the wiring; and
- forming a metal silicide layer on an interface between the wiring and the metallic film by causing reaction therebetween.

25 3. A method for manufacturing a semiconductor device according to claim 1, wherein the wiring thinning step comprises the steps of:

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oxidizing the wiring beginning an upper surface thereof up to
a depth thereof; and

removing an oxidized section of the wiring oxidized in the
oxidizing step.

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4. A method for manufacturing a semiconductor device according
to claim 1, wherein the metal is cobalt.

5. A method for manufacturing a semiconductor device, comprising
the steps of:

forming wiring comprising silicon on a surface of a
semiconductor substrate;

covering part of the wiring with a resist pattern;

implanting ions into the wiring using the resist pattern as a
15 mask;

removing the resist pattern;

oxidizing the wiring beginning an upper surface thereof up to
a depth thereof;

removing an oxidized section of the wiring oxidized in the
20 oxidizing step and thereby thinning the wiring; and

forming a metal silicide film on a surface of the wiring by
causing reaction between a surface section of the wiring of which
thickness is thus reduced and a refractory metal which reacts with
silicon to form silicide.

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6. A method for manufacturing a semiconductor device according

to claim 5, wherein the metal silicide forming step comprises the steps of:

depositing a metallic film comprising a refractory metal which reacts with silicon to form silicide, on a surface of the wiring; and

5 forming a metal silicide layer on an interface between the wiring and the metallic film by causing reaction therebetween.

7. A method for manufacturing a semiconductor device according to claim 5, wherein the oxidation depth to oxidize the wiring is at
10 least 5 nm, the oxidation depth being less than a thickness of the wiring.

8. A method for manufacturing a semiconductor device according to claim 5, wherein the refractory metal is cobalt.

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